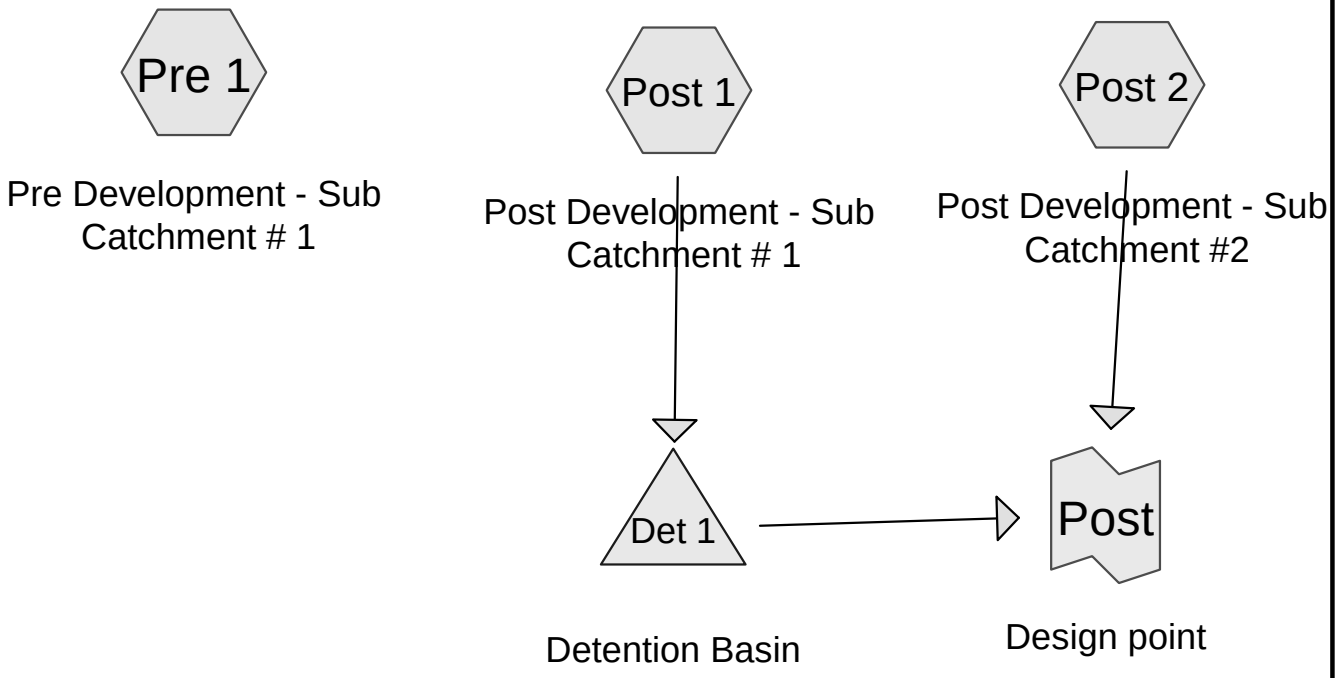


Subcat Reach Pond Link

Routing Diagram for Hydrology Calculations 05-20-21
Prepared by DiVesta Civil Engineering Associates, Inc., Printed 5/25/2021

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment Post 1: Post Development - Runoff Area=5,910 sf 65.43% Impervious Runoff Depth=2.09"
Flow Length=88' Tc=6.8 min CN=88 Runoff=0.32 cfs 0.024 af

Subcatchment Post 2: Post Development - Runoff Area=23,615 sf 3.98% Impervious Runoff Depth=1.28"
Flow Length=245' Tc=9.4 min CN=77 Runoff=0.70 cfs 0.058 af

Subcatchment Pre 1: Pre Development - Runoff Area=29,495 sf 0.00% Impervious Runoff Depth=1.10"
Flow Length=235' Tc=9.0 min CN=74 Runoff=0.74 cfs 0.062 af

Pond Det 1: Detention Basin Peak Elev=49.13' Storage=505 cf Inflow=0.32 cfs 0.024 af
Discarded=0.02 cfs 0.023 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.024 af

Link Post: Design point Inflow=0.70 cfs 0.058 af
Primary=0.70 cfs 0.058 af

Total Runoff Area = 1.355 ac Runoff Volume = 0.144 af Average Runoff Depth = 1.27"
91.86% Pervious = 1.245 ac 8.14% Impervious = 0.110 ac

Summary for Subcatchment Post 1: Post Development - Sub Catchment # 1

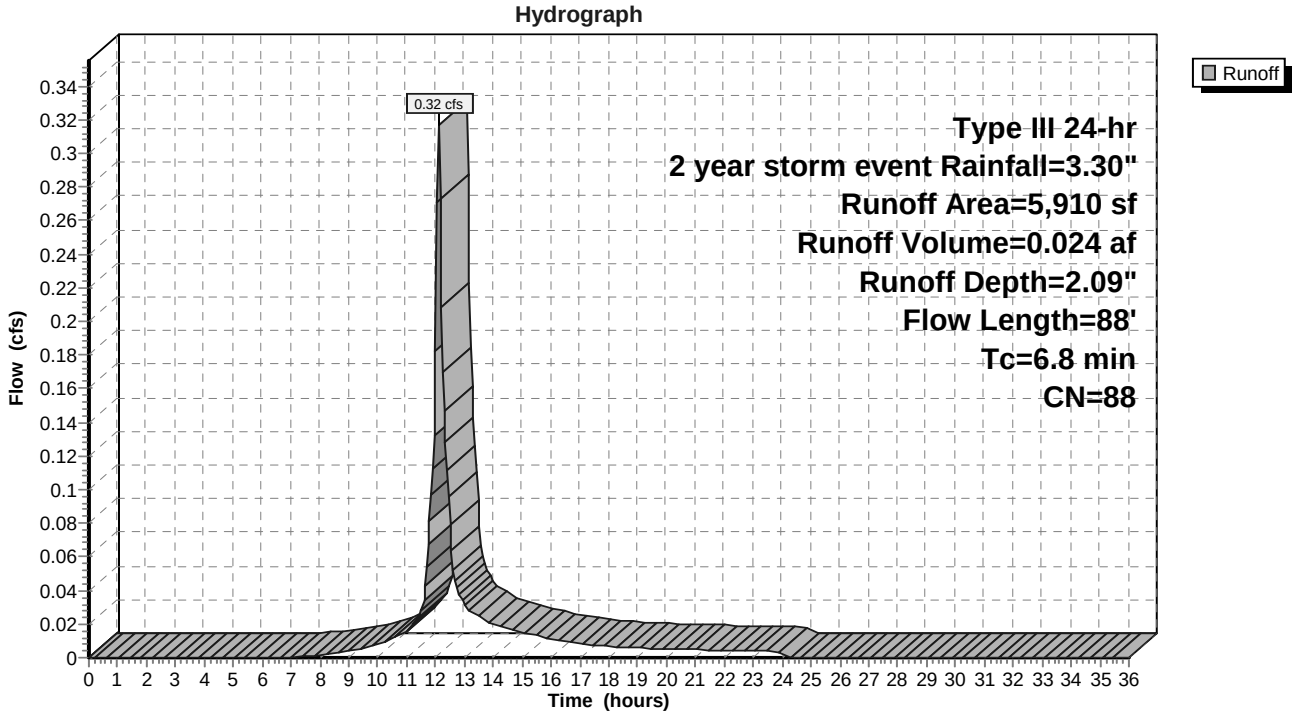
Runoff = 0.32 cfs @ 12.10 hrs, Volume= 0.024 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year storm event Rainfall=3.30"

	Area (sf)	CN	Description
*	2,762	98	roof area
*	295	98	walk
*	810	98	driveway
	2,043	69	50-75% Grass cover, Fair, HSG B
	5,910	88	Weighted Average
	2,043		34.57% Pervious Area
	3,867		65.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	73	0.0680	0.18		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.30"
0.1	15	0.0660	1.80		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
6.8	88	Total			

Subcatchment Post 1: Post Development - Sub Catchment # 1



Summary for Subcatchment Post 2: Post Development - Sub Catchment #2

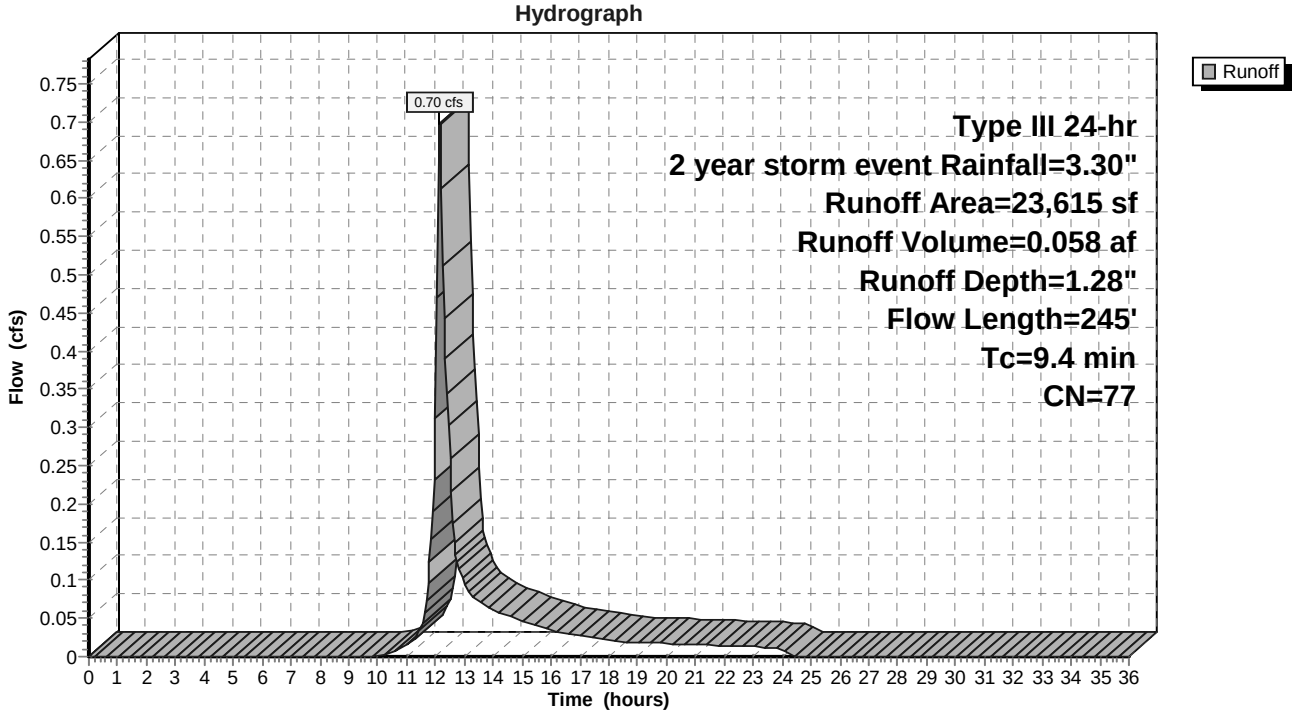
Runoff = 0.70 cfs @ 12.14 hrs, Volume= 0.058 af, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year storm event Rainfall=3.30"

	Area (sf)	CN	Description
	10,785	84	50-75% Grass cover, Fair, HSG D
*	756	98	patio
*	183	98	walk
	11,891	69	50-75% Grass cover, Fair, HSG B
	23,615	77	Weighted Average
	22,676		96.02% Pervious Area
	939		3.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	107	0.0930	0.22		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.30"
1.0	85	0.0420	1.43		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
0.4	53	0.0830	2.02		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
9.4	245	Total			

Subcatchment Post 2: Post Development - Sub Catchment #2



Summary for Subcatchment Pre 1: Pre Development - Sub Catchment # 1

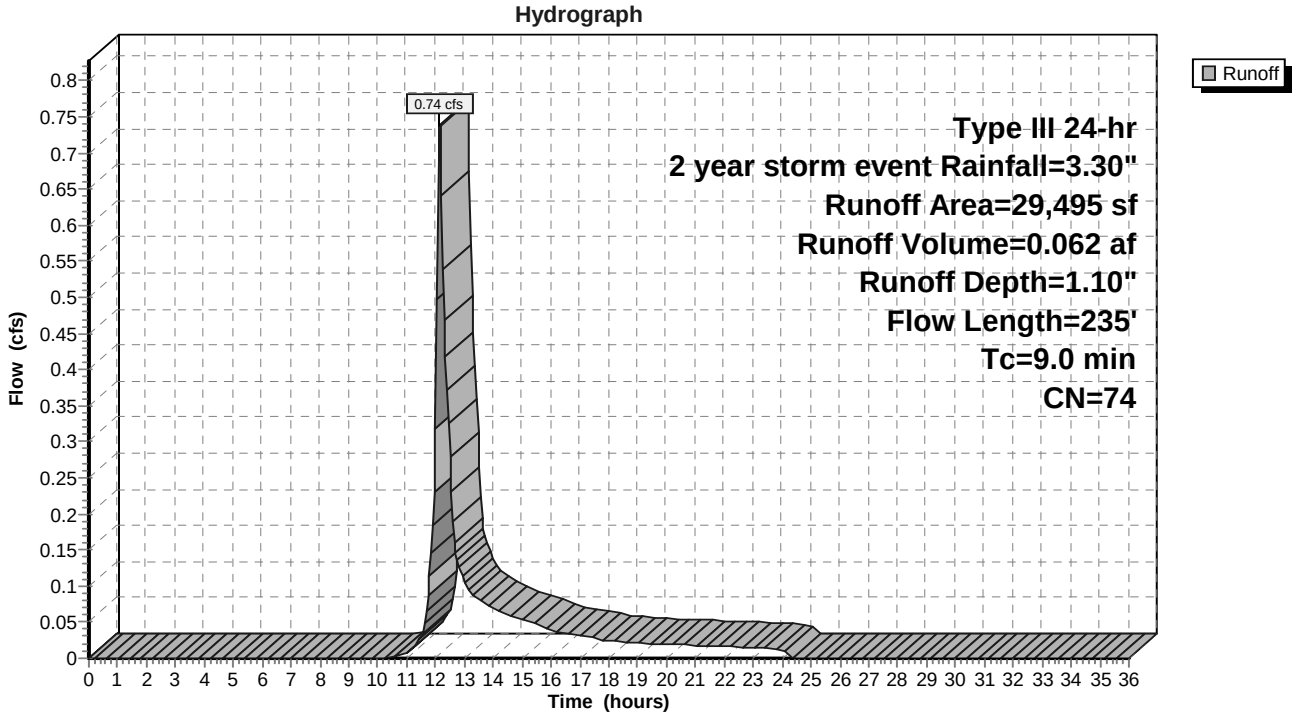
Runoff = 0.74 cfs @ 12.14 hrs, Volume= 0.062 af, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year storm event Rainfall=3.30"

Area (sf)	CN	Description
18,740	69	50-75% Grass cover, Fair, HSG B
10,755	84	50-75% Grass cover, Fair, HSG D
29,495	74	Weighted Average
29,495		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	104	0.0960	0.22		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.30"
1.0	88	0.0450	1.48		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
0.3	43	0.0930	2.13		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
9.0	235	Total			

Subcatchment Pre 1: Pre Development - Sub Catchment # 1



Summary for Pond Det 1: Detention Basin

Inflow Area = 0.136 ac, 65.43% Impervious, Inflow Depth = 2.09" for 2 year storm event event
Inflow = 0.32 cfs @ 12.10 hrs, Volume= 0.024 af
Outflow = 0.02 cfs @ 14.33 hrs, Volume= 0.024 af, Atten= 94%, Lag= 134.0 min
Discarded = 0.02 cfs @ 11.20 hrs, Volume= 0.023 af
Primary = 0.00 cfs @ 14.33 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 49.13' @ 14.33 hrs Surf.Area= 800 sf Storage= 505 cf

Plug-Flow detention time= 293.5 min calculated for 0.024 af (100% of inflow)
Center-of-Mass det. time= 293.4 min (1,107.9 - 814.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	48.10'	482 cf	**32.00'W x 25.00'L x 2.04'H Field A** 1,633 cf Overall - 428 cf Embedded = 1,205 cf x 40.0% Voids
#2A	48.60'	428 cf	**Cultec C-100HD** x 30 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 10 rows
		910 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	49.10'	**2.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	49.81'	**4.5" Vert. Orifice/Grate** C= 0.600
#3	Discarded	48.10'	**0.880 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 11.20 hrs HW=48.12' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 14.33 hrs HW=49.13' (Free Discharge)
├**1=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.59 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond Det 1: Detention Basin - Chamber Wizard Field A

Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)
Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf
Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap
Row Length Adjustment= +0.50' x 1.86 sf x 10 rows

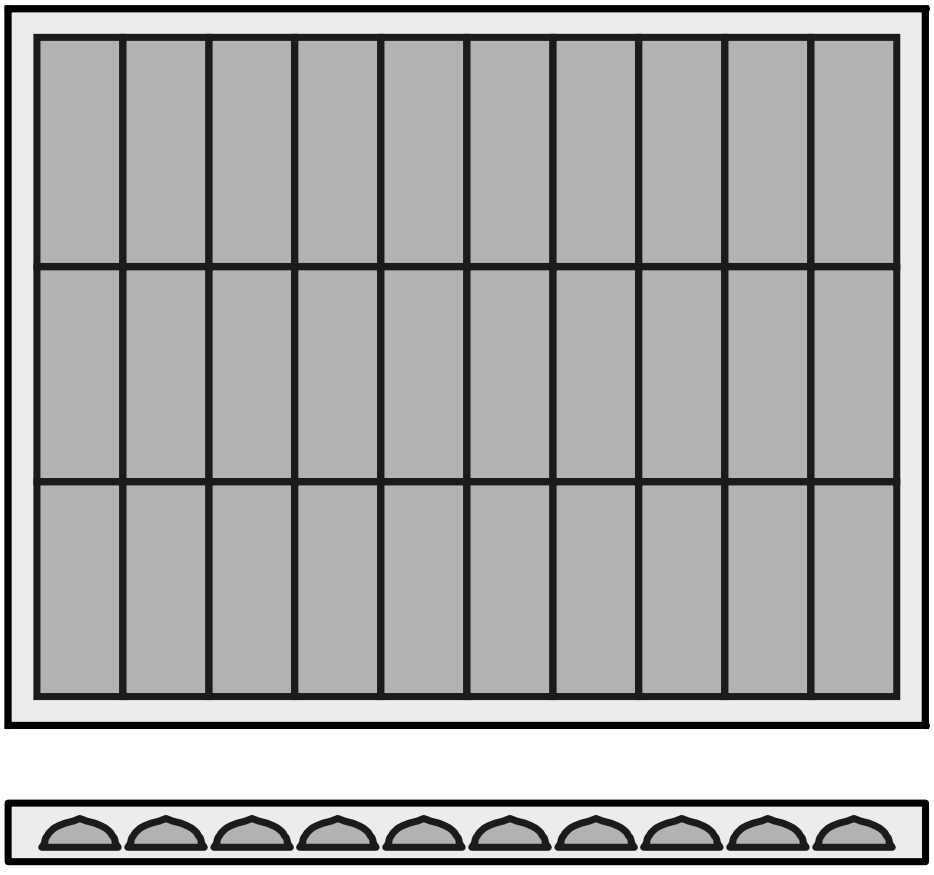
3 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 23.00' Row Length +12.0" End Stone x 2 = 25.00' Base Length
10 Rows x 36.0" Wide + 12.0" Side Stone x 2 = 32.00' Base Width
6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

30 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 10 Rows = 428.1 cf Chamber Storage

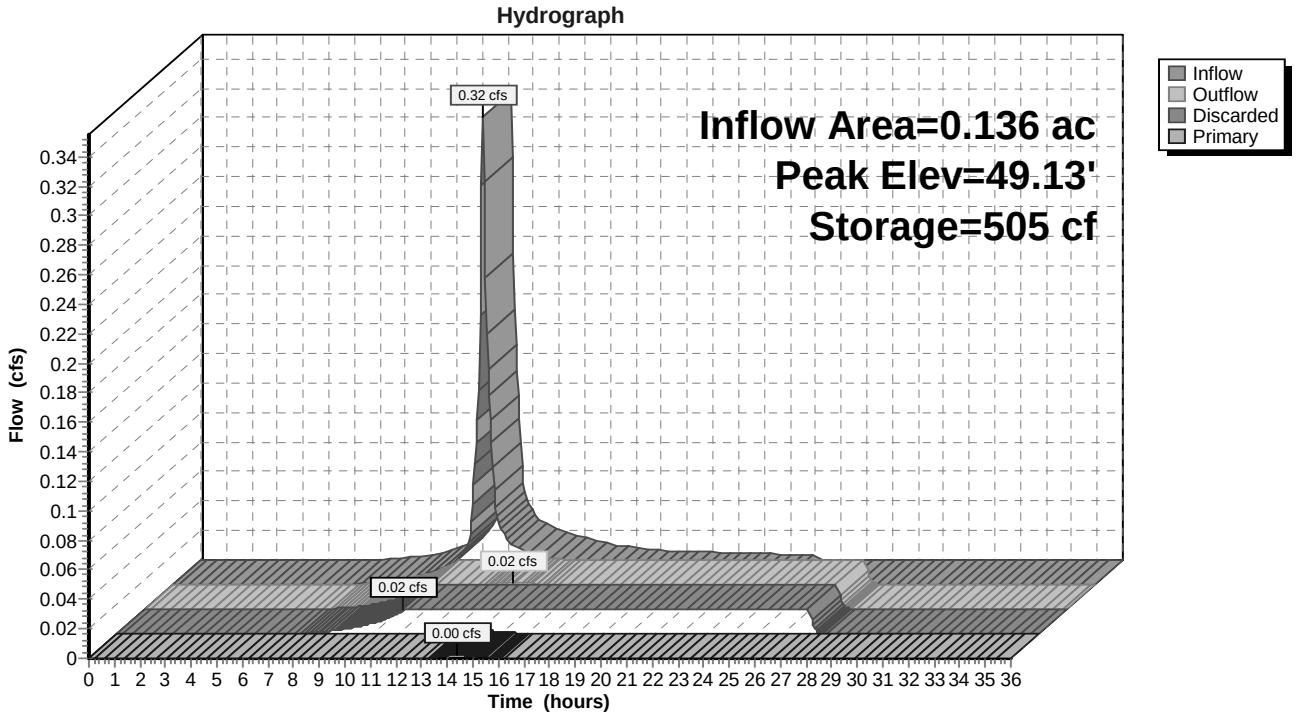
1,633.3 cf Field - 428.1 cf Chambers = 1,205.2 cf Stone x 40.0% Voids = 482.1 cf Stone Storage

Chamber Storage + Stone Storage = 910.2 cf = 0.021 af
Overall Storage Efficiency = 55.7%
Overall System Size = 25.00' x 32.00' x 2.04'

30 Chambers
60.5 cy Field
44.6 cy Stone



Pond Det 1: Detention Basin

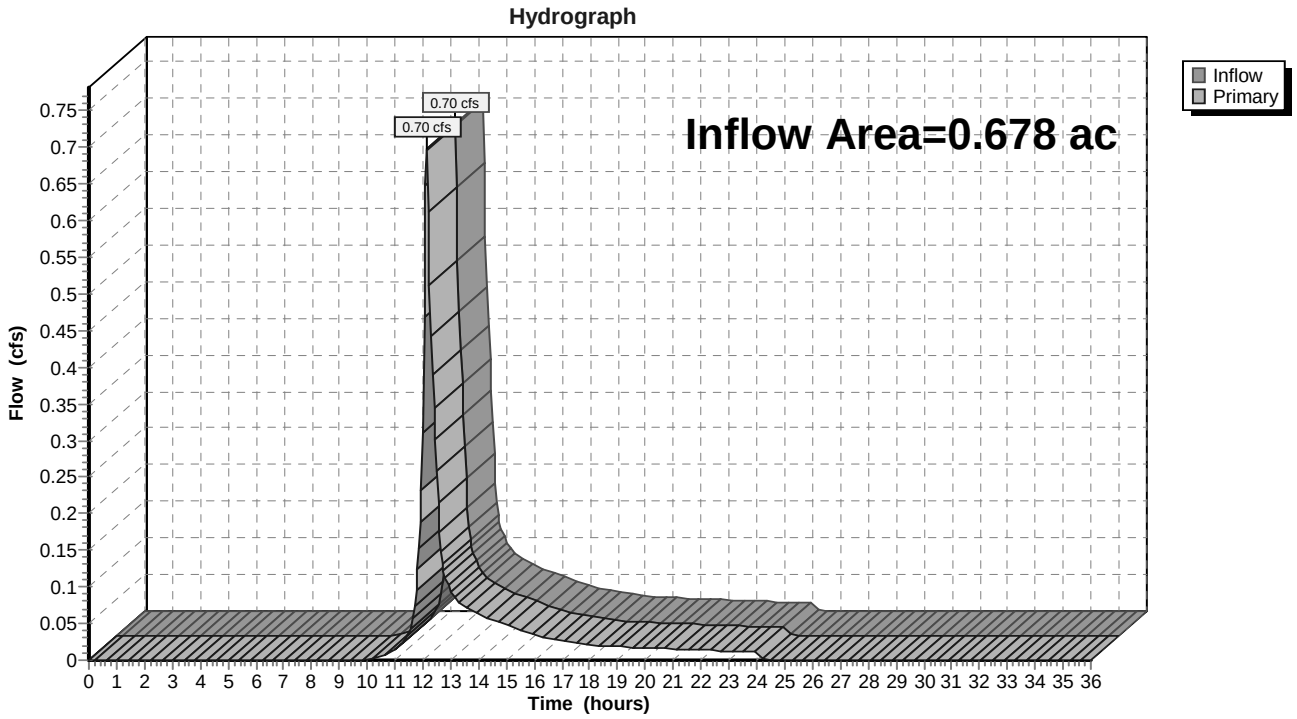


Summary for Link Post: Design point

Inflow Area = 0.678 ac, 16.28% Impervious, Inflow Depth = 1.03" for 2 year storm event event
Inflow = 0.70 cfs @ 12.14 hrs, Volume= 0.058 af
Primary = 0.70 cfs @ 12.14 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link Post: Design point



Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment Post 1: Post Development - Runoff Area=5,910 sf 65.43% Impervious Runoff Depth=3.67"
Flow Length=88' Tc=6.8 min CN=88 Runoff=0.55 cfs 0.041 af

Subcatchment Post 2: Post Development - Runoff Area=23,615 sf 3.98% Impervious Runoff Depth=2.62"
Flow Length=245' Tc=9.4 min CN=77 Runoff=1.46 cfs 0.118 af

Subcatchment Pre 1: Pre Development - Runoff Area=29,495 sf 0.00% Impervious Runoff Depth=2.36"
Flow Length=235' Tc=9.0 min CN=74 Runoff=1.65 cfs 0.133 af

Pond Det 1: Detention Basin Peak Elev=49.60' Storage=737 cf Inflow=0.55 cfs 0.041 af
Discarded=0.02 cfs 0.028 af Primary=0.10 cfs 0.013 af Outflow=0.12 cfs 0.041 af

Link Post: Design point Inflow=1.47 cfs 0.132 af
Primary=1.47 cfs 0.132 af

Total Runoff Area = 1.355 ac Runoff Volume = 0.293 af Average Runoff Depth = 2.60"
91.86% Pervious = 1.245 ac 8.14% Impervious = 0.110 ac

Summary for Subcatchment Post 1: Post Development - Sub Catchment # 1

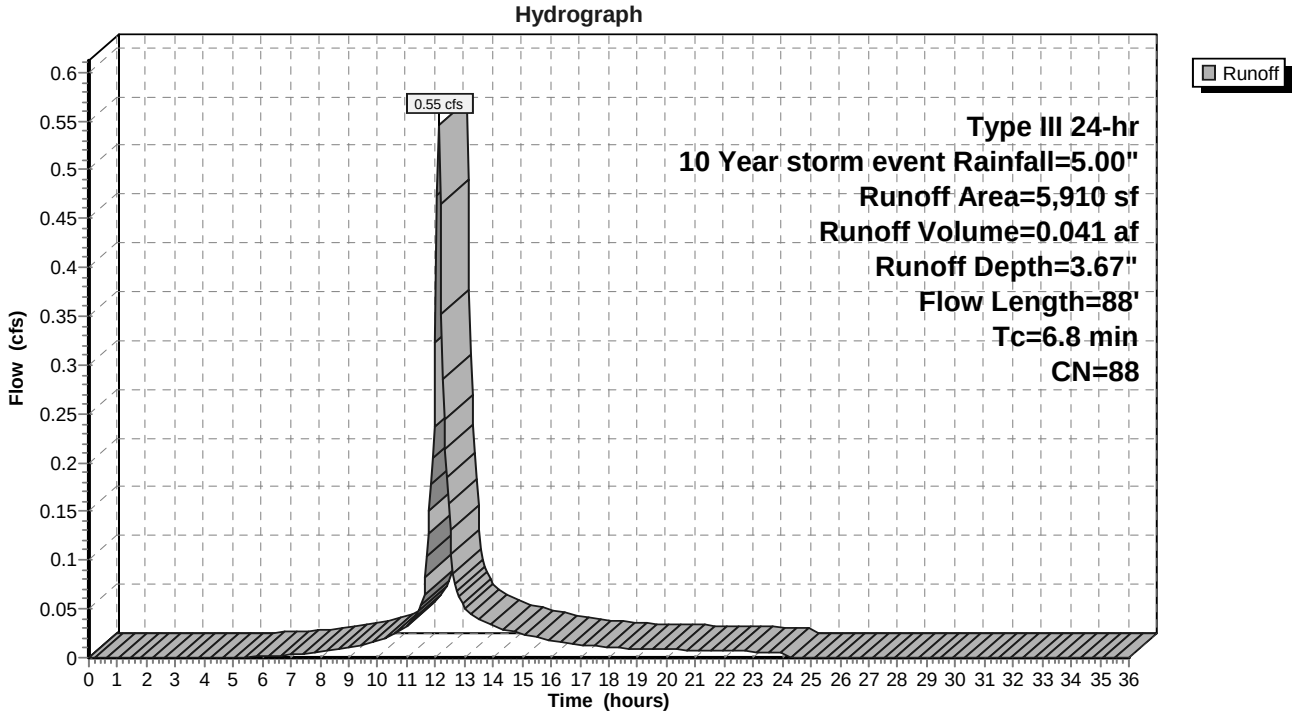
Runoff = 0.55 cfs @ 12.10 hrs, Volume= 0.041 af, Depth= 3.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year storm event Rainfall=5.00"

	Area (sf)	CN	Description
*	2,762	98	roof area
*	295	98	walk
*	810	98	driveway
	2,043	69	50-75% Grass cover, Fair, HSG B
	5,910	88	Weighted Average
	2,043		34.57% Pervious Area
	3,867		65.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	73	0.0680	0.18		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.30"
0.1	15	0.0660	1.80		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
6.8	88	Total			

Subcatchment Post 1: Post Development - Sub Catchment # 1



Summary for Subcatchment Post 2: Post Development - Sub Catchment #2

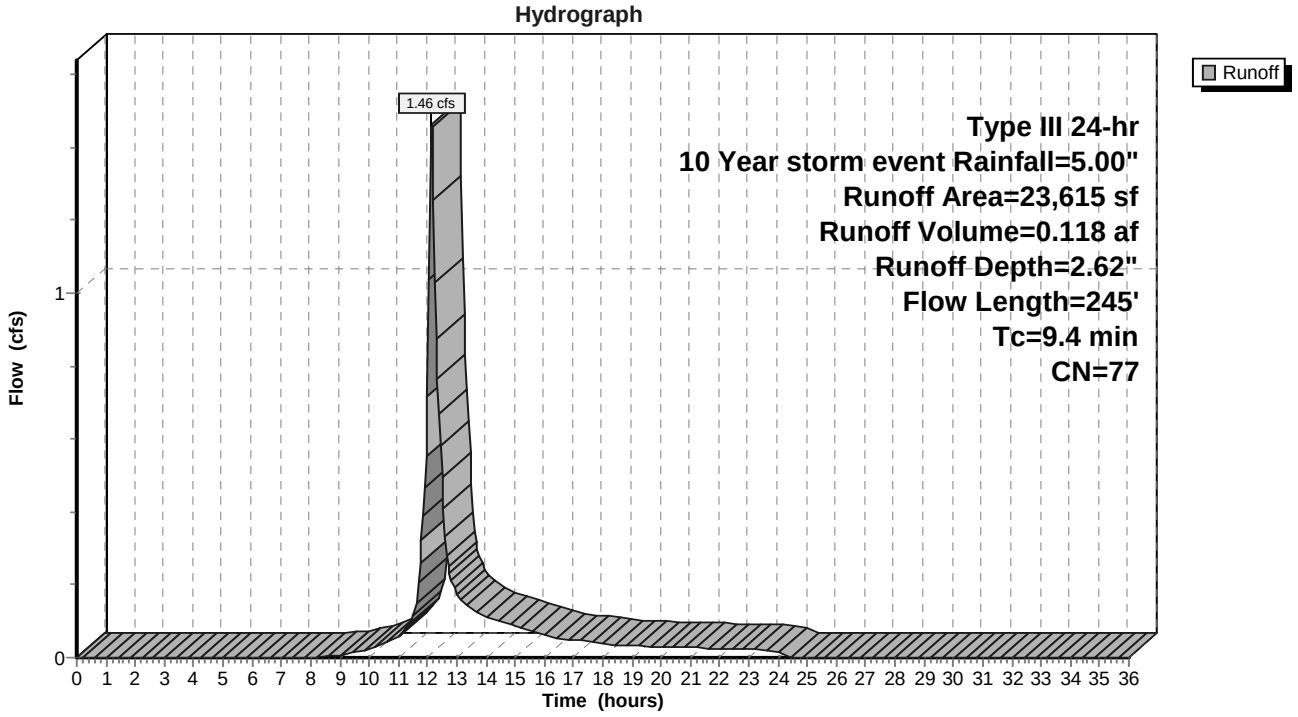
Runoff = 1.46 cfs @ 12.14 hrs, Volume= 0.118 af, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year storm event Rainfall=5.00"

	Area (sf)	CN	Description
	10,785	84	50-75% Grass cover, Fair, HSG D
*	756	98	patio
*	183	98	walk
	11,891	69	50-75% Grass cover, Fair, HSG B
	23,615	77	Weighted Average
	22,676		96.02% Pervious Area
	939		3.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	107	0.0930	0.22		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.30"
1.0	85	0.0420	1.43		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
0.4	53	0.0830	2.02		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
9.4	245	Total			

Subcatchment Post 2: Post Development - Sub Catchment #2



Summary for Subcatchment Pre 1: Pre Development - Sub Catchment # 1

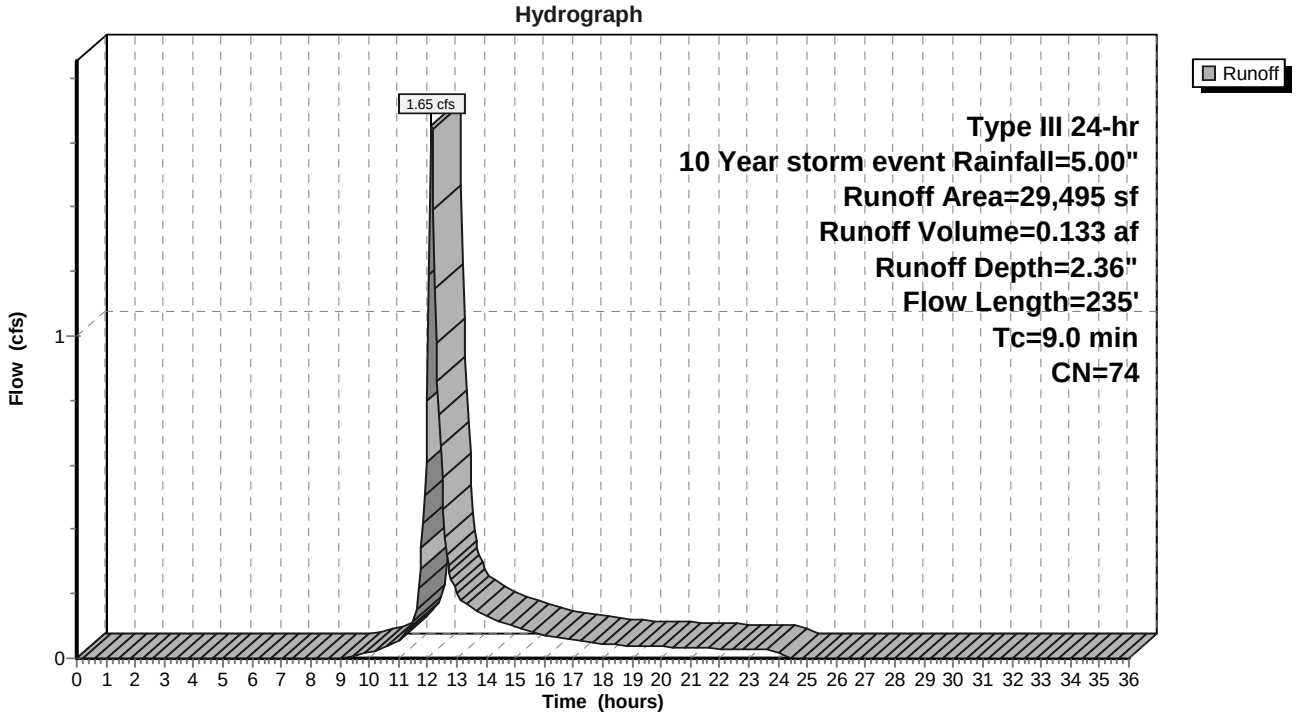
Runoff = 1.65 cfs @ 12.13 hrs, Volume= 0.133 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year storm event Rainfall=5.00"

Area (sf)	CN	Description
18,740	69	50-75% Grass cover, Fair, HSG B
10,755	84	50-75% Grass cover, Fair, HSG D
29,495	74	Weighted Average
29,495		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	104	0.0960	0.22		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.30"
1.0	88	0.0450	1.48		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
0.3	43	0.0930	2.13		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
9.0	235	Total			

Subcatchment Pre 1: Pre Development - Sub Catchment # 1



Summary for Pond Det 1: Detention Basin

Inflow Area = 0.136 ac, 65.43% Impervious, Inflow Depth = 3.67" for 10 Year storm event event
Inflow = 0.55 cfs @ 12.10 hrs, Volume= 0.041 af
Outflow = 0.12 cfs @ 12.52 hrs, Volume= 0.041 af, Atten= 78%, Lag= 25.4 min
Discarded = 0.02 cfs @ 9.95 hrs, Volume= 0.028 af
Primary = 0.10 cfs @ 12.52 hrs, Volume= 0.013 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 49.60' @ 12.52 hrs Surf.Area= 800 sf Storage= 737 cf

Plug-Flow detention time= 222.9 min calculated for 0.041 af (100% of inflow)
Center-of-Mass det. time= 223.1 min (1,021.7 - 798.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	48.10'	482 cf	**32.00'W x 25.00'L x 2.04'H Field A** 1,633 cf Overall - 428 cf Embedded = 1,205 cf x 40.0% Voids
#2A	48.60'	428 cf	**Cultec C-100HD** x 30 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 10 rows
		910 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	49.10'	**2.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	49.81'	**4.5" Vert. Orifice/Grate** C= 0.600
#3	Discarded	48.10'	**0.880 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 9.95 hrs HW=48.12' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.10 cfs @ 12.52 hrs HW=49.60' (Free Discharge)
├**1=Orifice/Grate** (Orifice Controls 0.10 cfs @ 3.02 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond Det 1: Detention Basin - Chamber Wizard Field A

Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)
Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf
Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap
Row Length Adjustment= +0.50' x 1.86 sf x 10 rows

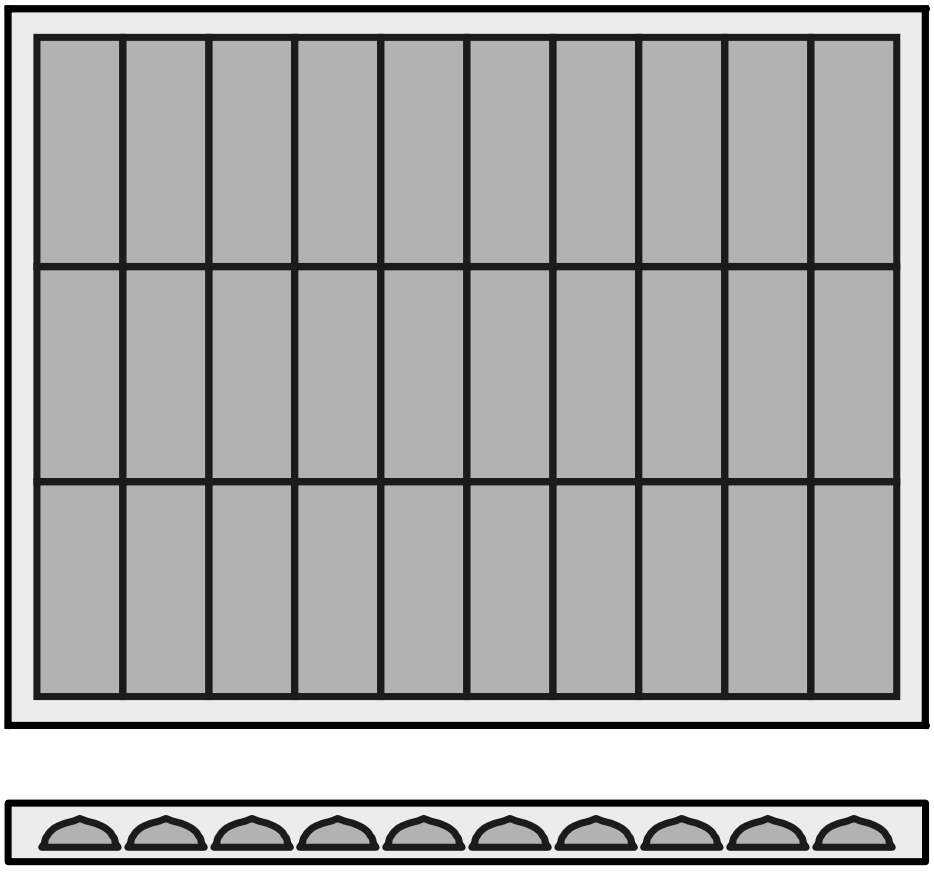
3 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 23.00' Row Length +12.0" End Stone x 2 = 25.00' Base Length
10 Rows x 36.0" Wide + 12.0" Side Stone x 2 = 32.00' Base Width
6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

30 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 10 Rows = 428.1 cf Chamber Storage

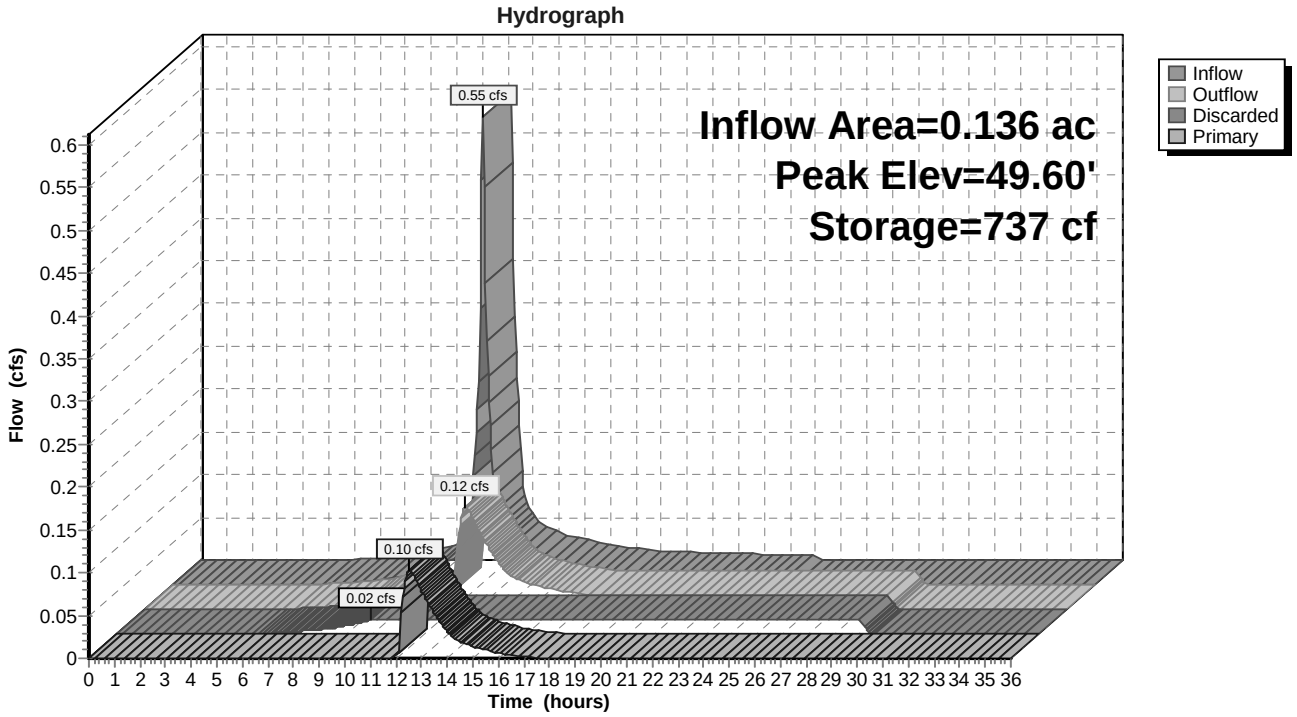
1,633.3 cf Field - 428.1 cf Chambers = 1,205.2 cf Stone x 40.0% Voids = 482.1 cf Stone Storage

Chamber Storage + Stone Storage = 910.2 cf = 0.021 af
Overall Storage Efficiency = 55.7%
Overall System Size = 25.00' x 32.00' x 2.04'

30 Chambers
60.5 cy Field
44.6 cy Stone



Pond Det 1: Detention Basin

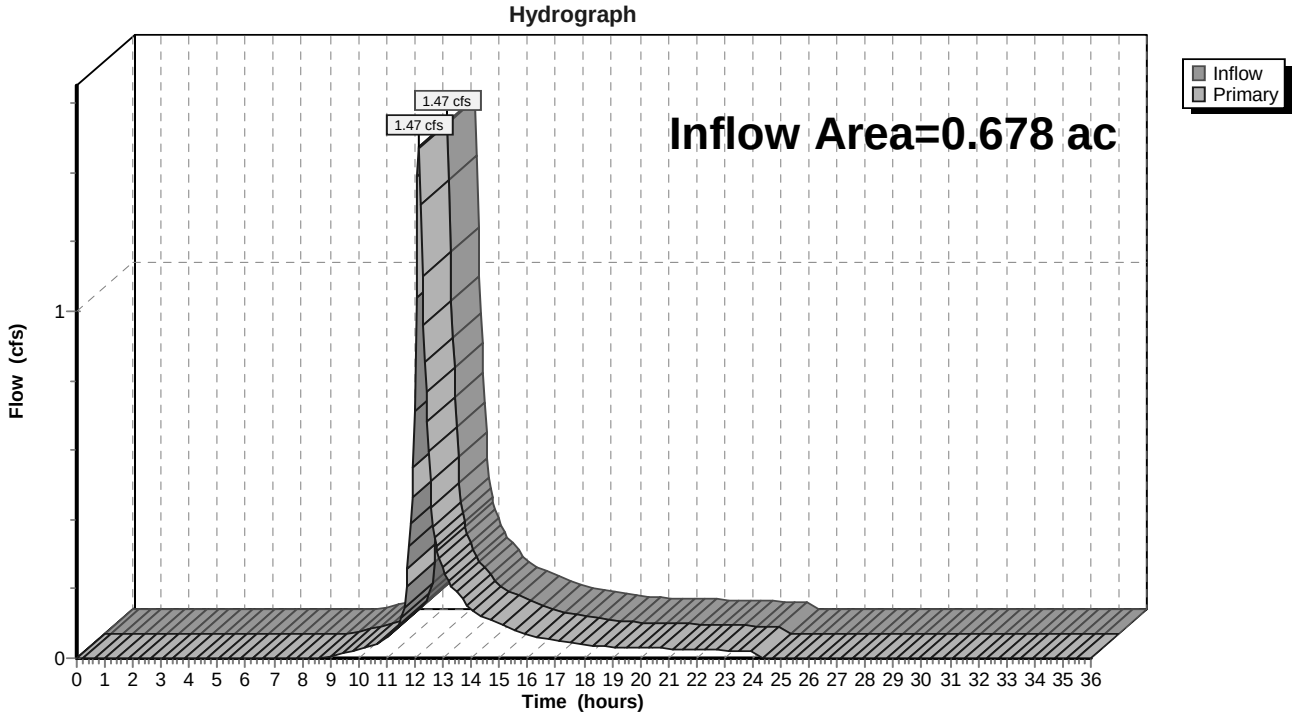


Summary for Link Post: Design point

Inflow Area = 0.678 ac, 16.28% Impervious, Inflow Depth = 2.33" for 10 Year storm event event
Inflow = 1.47 cfs @ 12.14 hrs, Volume= 0.132 af
Primary = 1.47 cfs @ 12.14 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link Post: Design point



Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment Post 1: Post Development - Runoff Area=5,910 sf 65.43% Impervious Runoff Depth=4.34"
Flow Length=88' Tc=6.8 min CN=88 Runoff=0.64 cfs 0.049 af

Subcatchment Post 2: Post Development - Runoff Area=23,615 sf 3.98% Impervious Runoff Depth=3.22"
Flow Length=245' Tc=9.4 min CN=77 Runoff=1.79 cfs 0.145 af

Subcatchment Pre 1: Pre Development - Runoff Area=29,495 sf 0.00% Impervious Runoff Depth=2.93"
Flow Length=235' Tc=9.0 min CN=74 Runoff=2.06 cfs 0.166 af

Pond Det 1: Detention Basin Peak Elev=49.92' Storage=841 cf Inflow=0.64 cfs 0.049 af
Discarded=0.02 cfs 0.030 af Primary=0.17 cfs 0.019 af Outflow=0.19 cfs 0.049 af

Link Post: Design point Inflow=1.86 cfs 0.165 af
Primary=1.86 cfs 0.165 af

Total Runoff Area = 1.355 ac Runoff Volume = 0.360 af Average Runoff Depth = 3.19"
91.86% Pervious = 1.245 ac 8.14% Impervious = 0.110 ac

Summary for Subcatchment Post 1: Post Development - Sub Catchment # 1

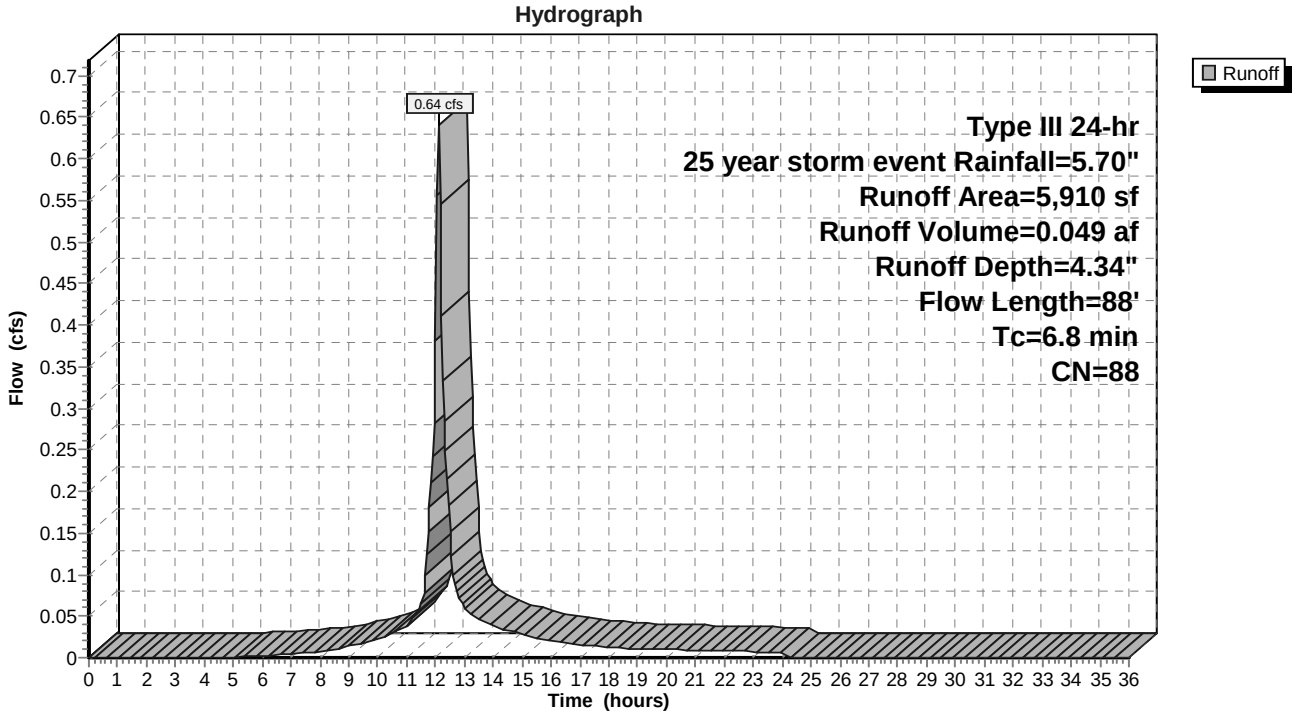
Runoff = 0.64 cfs @ 12.10 hrs, Volume= 0.049 af, Depth= 4.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year storm event Rainfall=5.70"

	Area (sf)	CN	Description
*	2,762	98	roof area
*	295	98	walk
*	810	98	driveway
	2,043	69	50-75% Grass cover, Fair, HSG B
	5,910	88	Weighted Average
	2,043		34.57% Pervious Area
	3,867		65.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	73	0.0680	0.18		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.30"
0.1	15	0.0660	1.80		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
6.8	88	Total			

Subcatchment Post 1: Post Development - Sub Catchment # 1



Summary for Subcatchment Post 2: Post Development - Sub Catchment #2

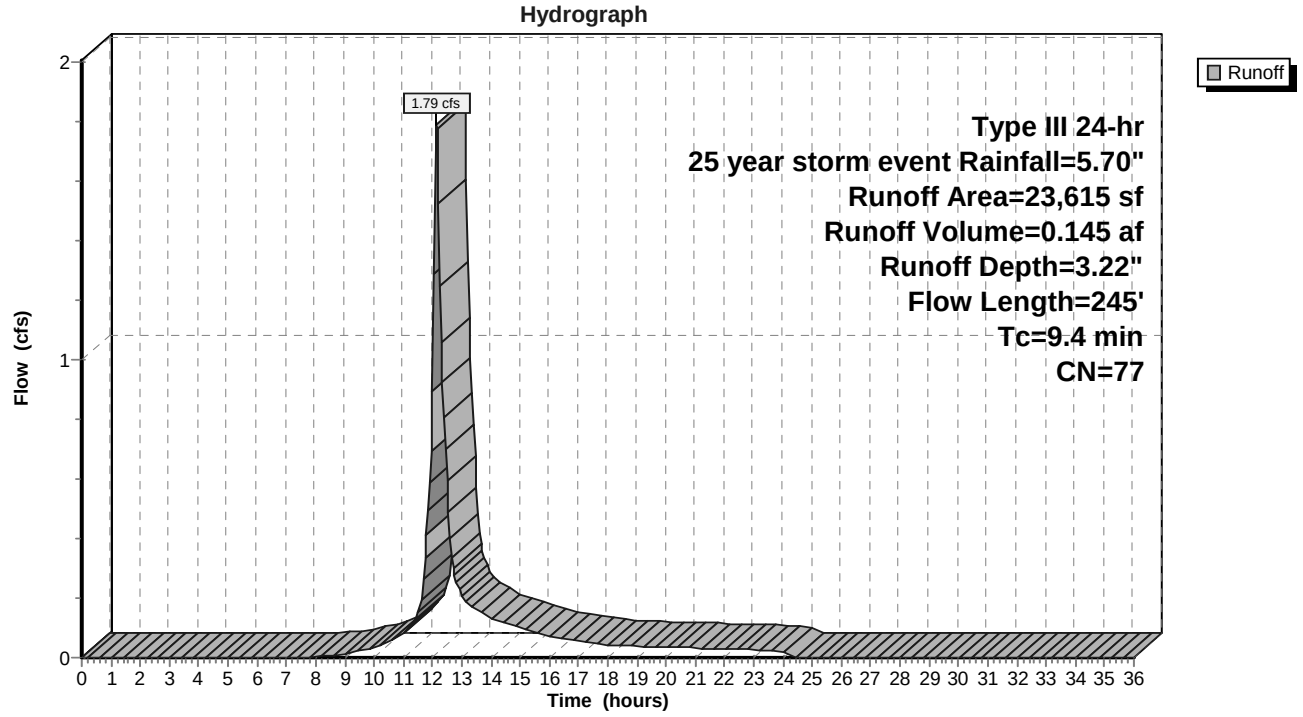
Runoff = 1.79 cfs @ 12.14 hrs, Volume= 0.145 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year storm event Rainfall=5.70"

	Area (sf)	CN	Description
	10,785	84	50-75% Grass cover, Fair, HSG D
*	756	98	patio
*	183	98	walk
	11,891	69	50-75% Grass cover, Fair, HSG B
	23,615	77	Weighted Average
	22,676		96.02% Pervious Area
	939		3.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	107	0.0930	0.22		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.30"
1.0	85	0.0420	1.43		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
0.4	53	0.0830	2.02		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
9.4	245	Total			

Subcatchment Post 2: Post Development - Sub Catchment #2



Summary for Subcatchment Pre 1: Pre Development - Sub Catchment # 1

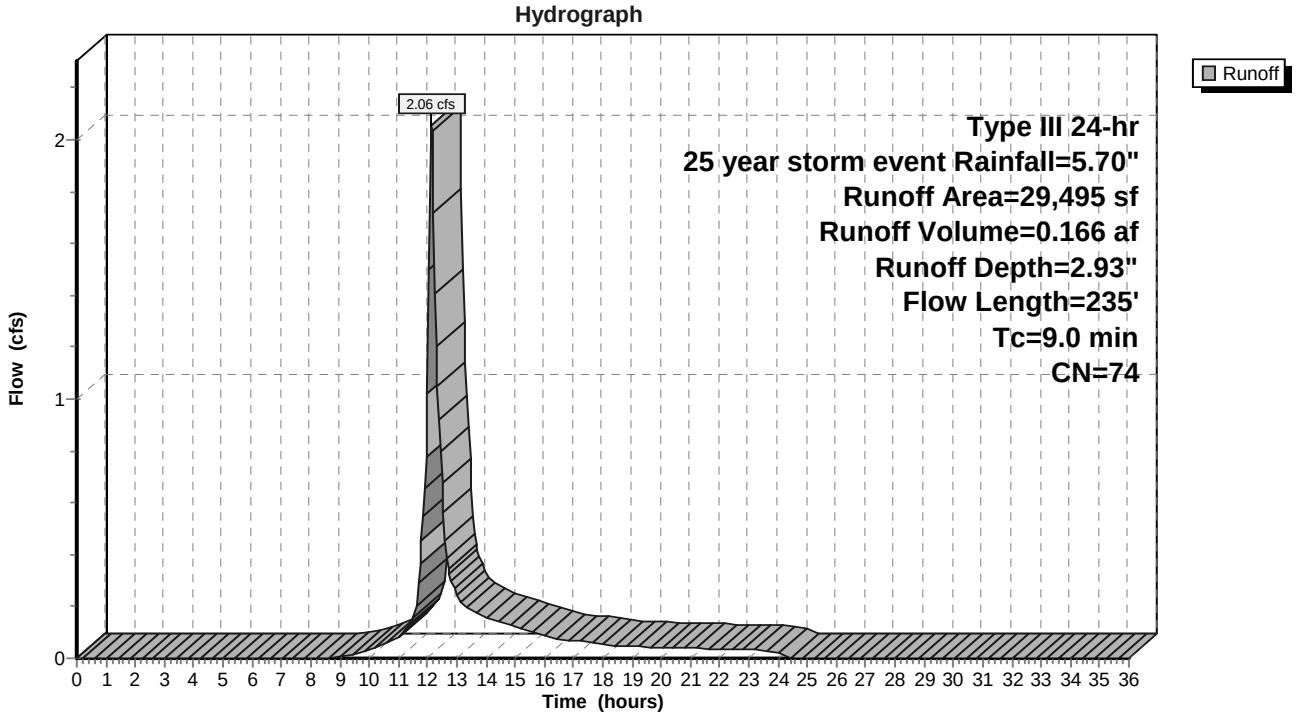
Runoff = 2.06 cfs @ 12.13 hrs, Volume= 0.166 af, Depth= 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year storm event Rainfall=5.70"

Area (sf)	CN	Description
18,740	69	50-75% Grass cover, Fair, HSG B
10,755	84	50-75% Grass cover, Fair, HSG D
29,495	74	Weighted Average
29,495		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	104	0.0960	0.22		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.30"
1.0	88	0.0450	1.48		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
0.3	43	0.0930	2.13		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
9.0	235	Total			

Subcatchment Pre 1: Pre Development - Sub Catchment # 1



Summary for Pond Det 1: Detention Basin

Inflow Area = 0.136 ac, 65.43% Impervious, Inflow Depth = 4.34" for 25 year storm event event
Inflow = 0.64 cfs @ 12.10 hrs, Volume= 0.049 af
Outflow = 0.19 cfs @ 12.45 hrs, Volume= 0.049 af, Atten= 71%, Lag= 20.8 min
Discarded = 0.02 cfs @ 9.45 hrs, Volume= 0.030 af
Primary = 0.17 cfs @ 12.45 hrs, Volume= 0.019 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 49.92' @ 12.45 hrs Surf.Area= 800 sf Storage= 841 cf

Plug-Flow detention time= 204.8 min calculated for 0.049 af (100% of inflow)
Center-of-Mass det. time= 205.1 min (999.1 - 794.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	48.10'	482 cf	**32.00'W x 25.00'L x 2.04'H Field A** 1,633 cf Overall - 428 cf Embedded = 1,205 cf x 40.0% Voids
#2A	48.60'	428 cf	**Cultec C-100HD** x 30 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 10 rows
		910 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	49.10'	**2.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	49.81'	**4.5" Vert. Orifice/Grate** C= 0.600
#3	Discarded	48.10'	**0.880 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 9.45 hrs HW=48.12' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.17 cfs @ 12.45 hrs HW=49.92' (Free Discharge)
├**1=Orifice/Grate** (Orifice Controls 0.14 cfs @ 4.08 fps)
└**2=Orifice/Grate** (Orifice Controls 0.03 cfs @ 1.15 fps)

Pond Det 1: Detention Basin - Chamber Wizard Field A

Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)
Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf
Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap
Row Length Adjustment= +0.50' x 1.86 sf x 10 rows

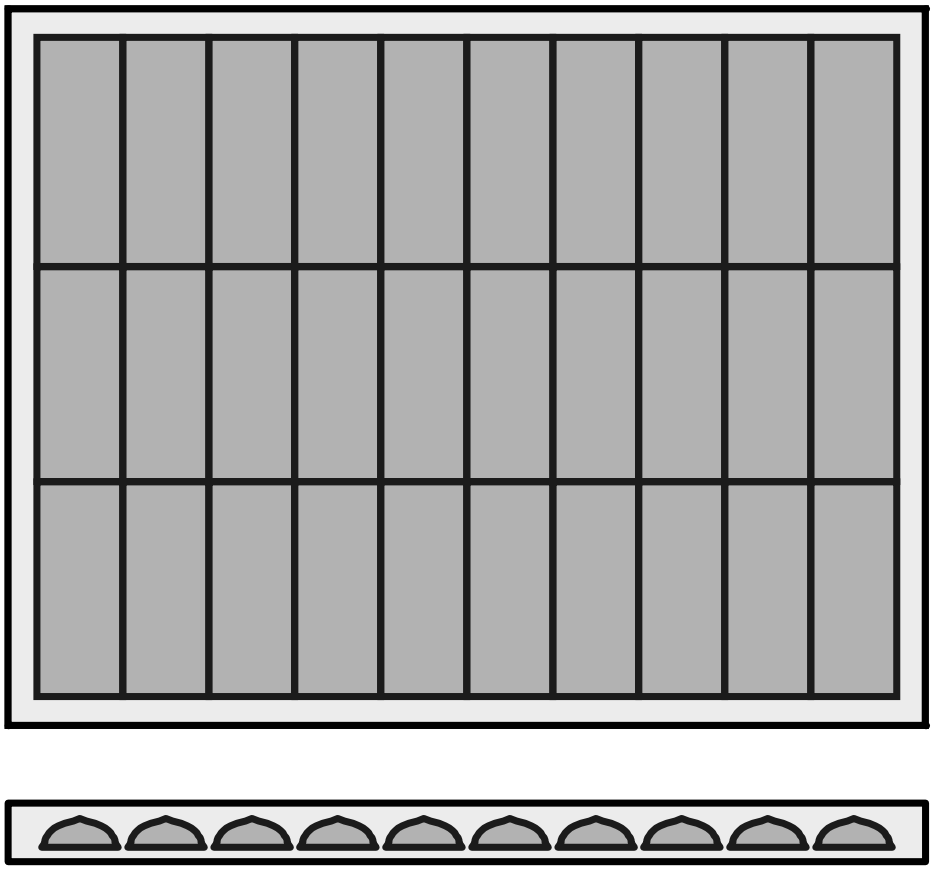
3 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 23.00' Row Length +12.0" End Stone x 2 = 25.00' Base Length
10 Rows x 36.0" Wide + 12.0" Side Stone x 2 = 32.00' Base Width
6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

30 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 10 Rows = 428.1 cf Chamber Storage

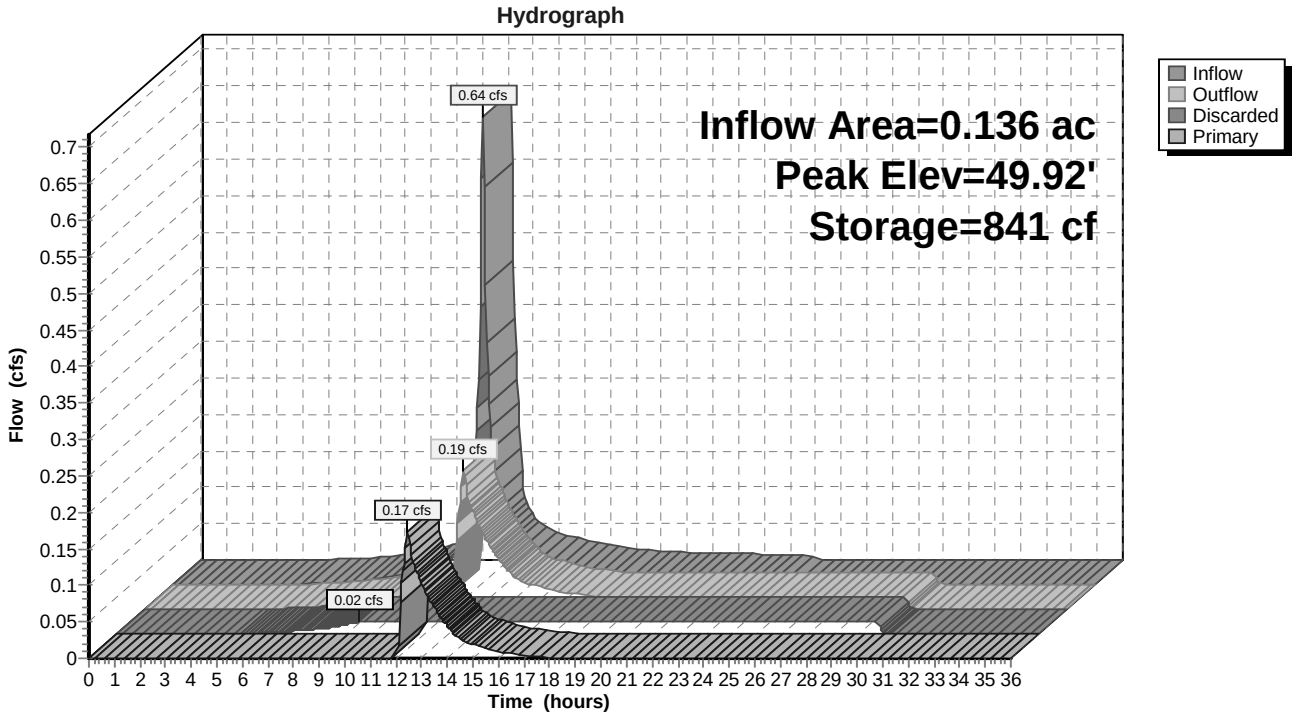
1,633.3 cf Field - 428.1 cf Chambers = 1,205.2 cf Stone x 40.0% Voids = 482.1 cf Stone Storage

Chamber Storage + Stone Storage = 910.2 cf = 0.021 af
Overall Storage Efficiency = 55.7%
Overall System Size = 25.00' x 32.00' x 2.04'

30 Chambers
60.5 cy Field
44.6 cy Stone



Pond Det 1: Detention Basin

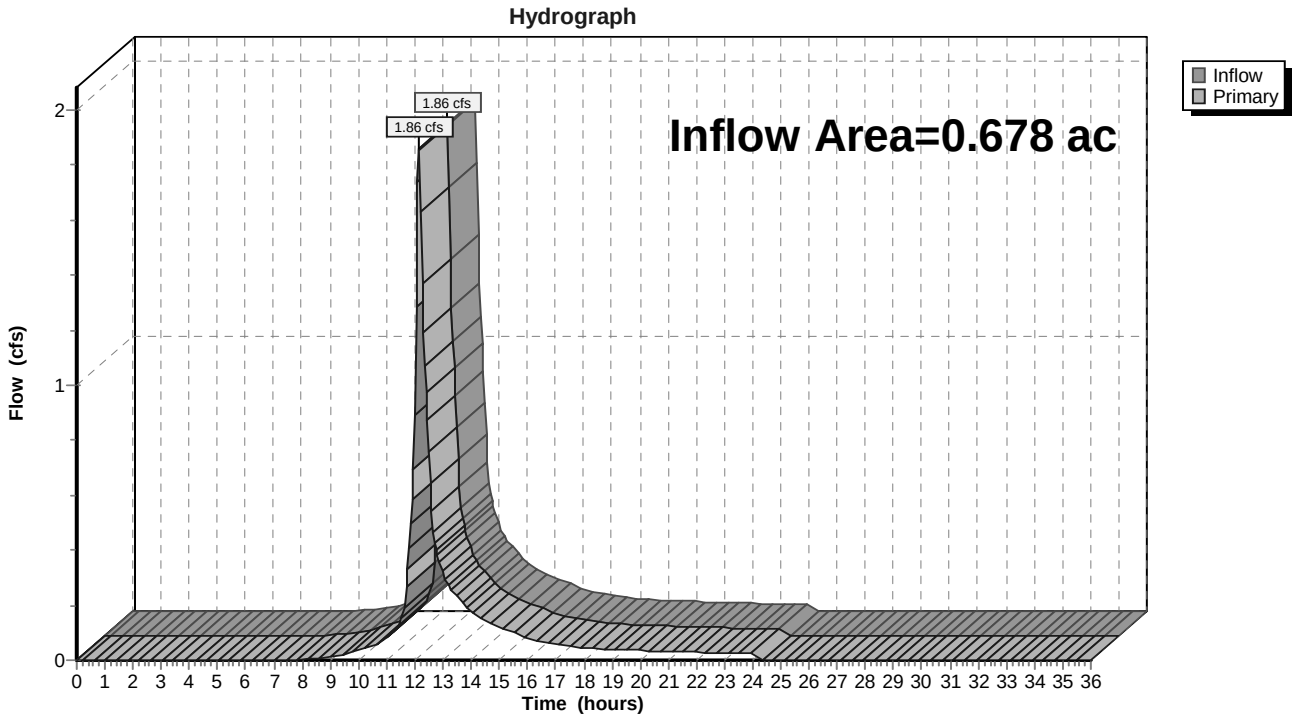


Summary for Link Post: Design point

Inflow Area = 0.678 ac, 16.28% Impervious, Inflow Depth = 2.92" for 25 year storm event event
Inflow = 1.86 cfs @ 12.14 hrs, Volume= 0.165 af
Primary = 1.86 cfs @ 12.14 hrs, Volume= 0.165 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link Post: Design point



Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment Post 1: Post Development - Runoff Area=5,910 sf 65.43% Impervious Runoff Depth=5.01"
Flow Length=88' Tc=6.8 min CN=88 Runoff=0.74 cfs 0.057 af

Subcatchment Post 2: Post Development - Runoff Area=23,615 sf 3.98% Impervious Runoff Depth=3.83"
Flow Length=245' Tc=9.4 min CN=77 Runoff=2.13 cfs 0.173 af

Subcatchment Pre 1: Pre Development - Runoff Area=29,495 sf 0.00% Impervious Runoff Depth=3.52"
Flow Length=235' Tc=9.0 min CN=74 Runoff=2.48 cfs 0.199 af

Pond Det 1: Detention Basin Peak Elev=50.08' Storage=891 cf Inflow=0.74 cfs 0.057 af
Discarded=0.02 cfs 0.031 af Primary=0.31 cfs 0.026 af Outflow=0.32 cfs 0.057 af

Link Post: Design point Inflow=2.24 cfs 0.199 af
Primary=2.24 cfs 0.199 af

Total Runoff Area = 1.355 ac Runoff Volume = 0.429 af Average Runoff Depth = 3.80"
91.86% Pervious = 1.245 ac 8.14% Impervious = 0.110 ac

Summary for Subcatchment Post 1: Post Development - Sub Catchment # 1

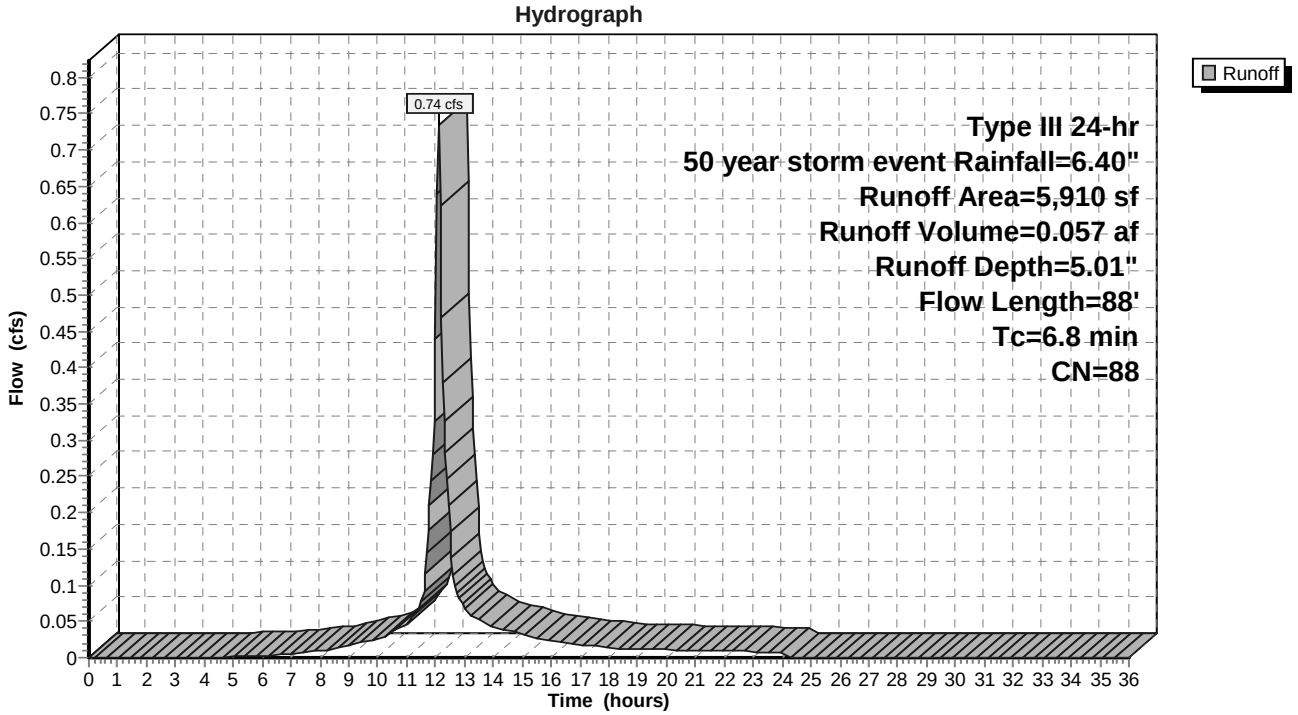
Runoff = 0.74 cfs @ 12.10 hrs, Volume= 0.057 af, Depth= 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year storm event Rainfall=6.40"

	Area (sf)	CN	Description
*	2,762	98	roof area
*	295	98	walk
*	810	98	driveway
	2,043	69	50-75% Grass cover, Fair, HSG B
	5,910	88	Weighted Average
	2,043		34.57% Pervious Area
	3,867		65.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	73	0.0680	0.18		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.30"
0.1	15	0.0660	1.80		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
6.8	88	Total			

Subcatchment Post 1: Post Development - Sub Catchment # 1



Summary for Subcatchment Post 2: Post Development - Sub Catchment #2

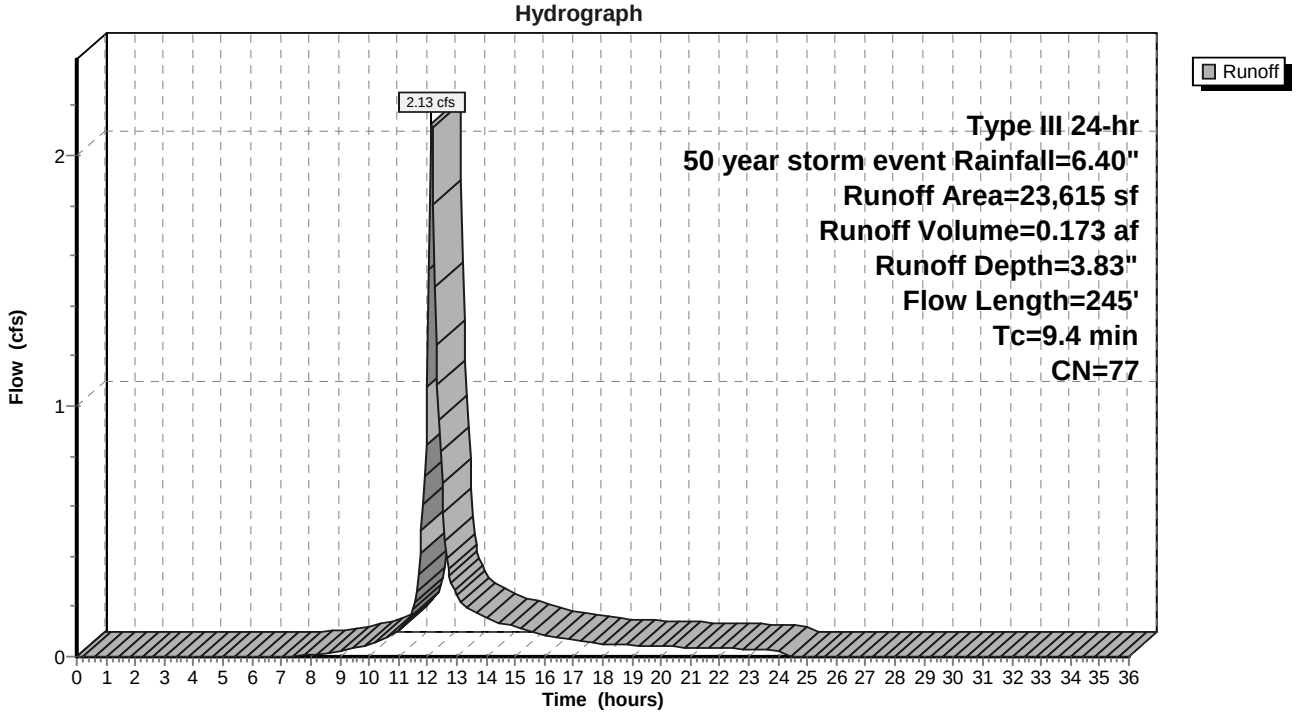
Runoff = 2.13 cfs @ 12.14 hrs, Volume= 0.173 af, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year storm event Rainfall=6.40"

	Area (sf)	CN	Description
	10,785	84	50-75% Grass cover, Fair, HSG D
*	756	98	patio
*	183	98	walk
	11,891	69	50-75% Grass cover, Fair, HSG B
	23,615	77	Weighted Average
	22,676		96.02% Pervious Area
	939		3.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	107	0.0930	0.22		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.30"
1.0	85	0.0420	1.43		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
0.4	53	0.0830	2.02		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
9.4	245	Total			

Subcatchment Post 2: Post Development - Sub Catchment #2



Summary for Subcatchment Pre 1: Pre Development - Sub Catchment # 1

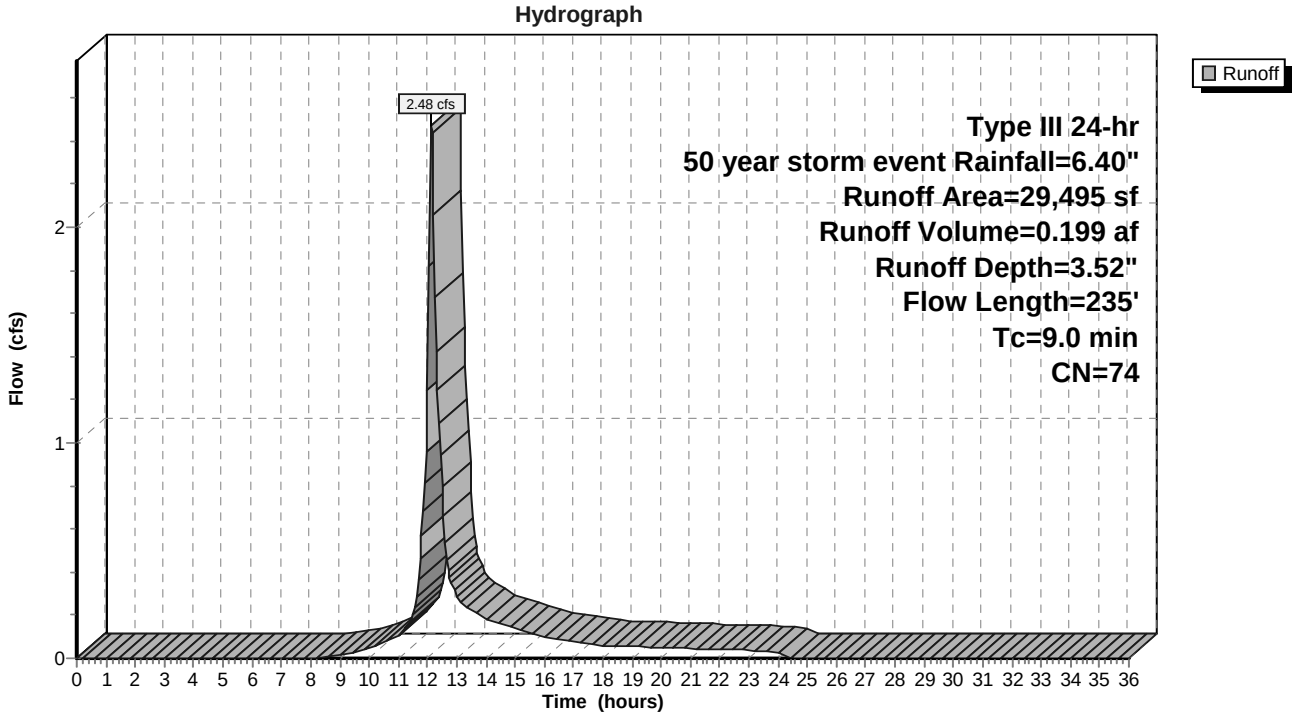
Runoff = 2.48 cfs @ 12.13 hrs, Volume= 0.199 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year storm event Rainfall=6.40"

Area (sf)	CN	Description
18,740	69	50-75% Grass cover, Fair, HSG B
10,755	84	50-75% Grass cover, Fair, HSG D
29,495	74	Weighted Average
29,495		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	104	0.0960	0.22		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.30"
1.0	88	0.0450	1.48		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
0.3	43	0.0930	2.13		**Shallow Concentrated Flow, shallow concentrated flow** Short Grass Pasture Kv= 7.0 fps
9.0	235	Total			

Subcatchment Pre 1: Pre Development - Sub Catchment # 1



Summary for Pond Det 1: Detention Basin

Inflow Area = 0.136 ac, 65.43% Impervious, Inflow Depth = 5.01" for 50 year storm event event
Inflow = 0.74 cfs @ 12.10 hrs, Volume= 0.057 af
Outflow = 0.32 cfs @ 12.31 hrs, Volume= 0.057 af, Atten= 56%, Lag= 12.7 min
Discarded = 0.02 cfs @ 9.05 hrs, Volume= 0.031 af
Primary = 0.31 cfs @ 12.31 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 50.08' @ 12.31 hrs Surf.Area= 800 sf Storage= 891 cf

Plug-Flow detention time= 189.0 min calculated for 0.057 af (100% of inflow)
Center-of-Mass det. time= 189.4 min (979.5 - 790.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	48.10'	482 cf	**32.00'W x 25.00'L x 2.04'H Field A** 1,633 cf Overall - 428 cf Embedded = 1,205 cf x 40.0% Voids
#2A	48.60'	428 cf	**Cultec C-100HD** x 30 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 10 rows
		910 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	49.10'	**2.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	49.81'	**4.5" Vert. Orifice/Grate** C= 0.600
#3	Discarded	48.10'	**0.880 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 9.05 hrs HW=48.12' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.30 cfs @ 12.31 hrs HW=50.08' (Free Discharge)
├**1=Orifice/Grate** (Orifice Controls 0.15 cfs @ 4.51 fps)
└**2=Orifice/Grate** (Orifice Controls 0.15 cfs @ 1.77 fps)

Pond Det 1: Detention Basin - Chamber Wizard Field A

Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)
Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf
Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap
Row Length Adjustment= +0.50' x 1.86 sf x 10 rows

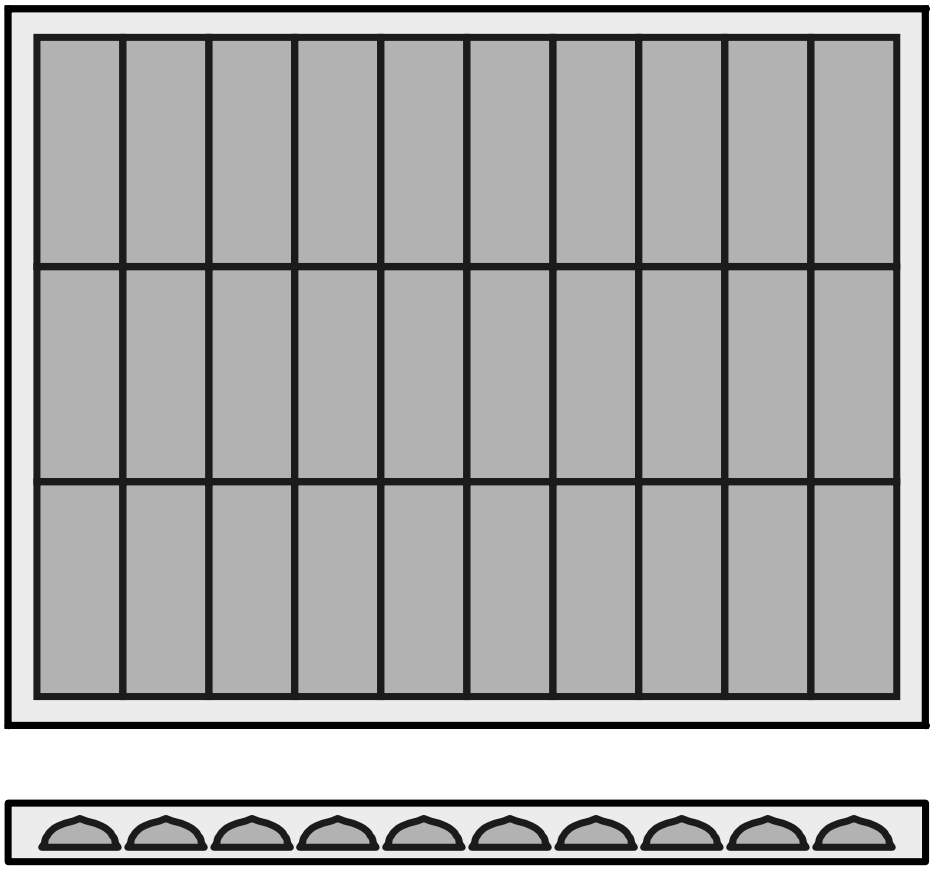
3 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 23.00' Row Length +12.0" End Stone x 2 = 25.00' Base Length
10 Rows x 36.0" Wide + 12.0" Side Stone x 2 = 32.00' Base Width
6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

30 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 10 Rows = 428.1 cf Chamber Storage

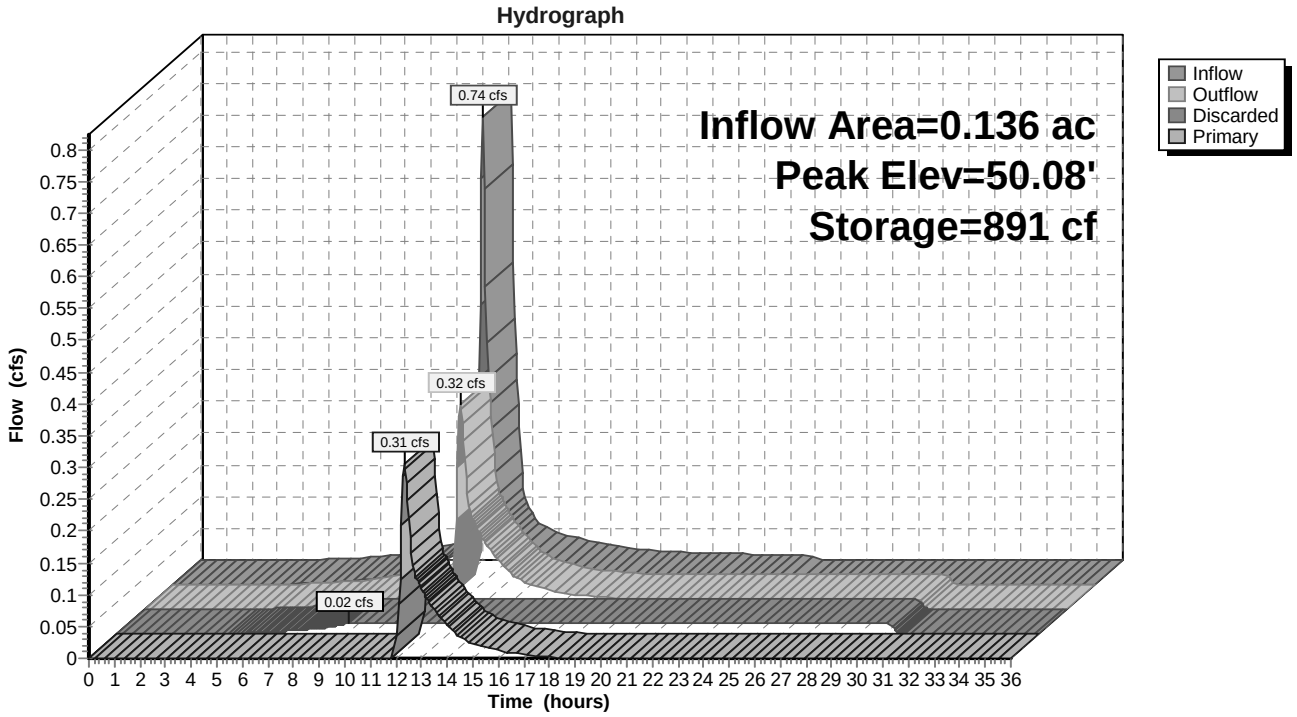
1,633.3 cf Field - 428.1 cf Chambers = 1,205.2 cf Stone x 40.0% Voids = 482.1 cf Stone Storage

Chamber Storage + Stone Storage = 910.2 cf = 0.021 af
Overall Storage Efficiency = 55.7%
Overall System Size = 25.00' x 32.00' x 2.04'

30 Chambers
60.5 cy Field
44.6 cy Stone



Pond Det 1: Detention Basin



Summary for Link Post: Design point

Inflow Area = 0.678 ac, 16.28% Impervious, Inflow Depth = 3.52" for 50 year storm event event
Inflow = 2.24 cfs @ 12.14 hrs, Volume= 0.199 af
Primary = 2.24 cfs @ 12.14 hrs, Volume= 0.199 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link Post: Design point